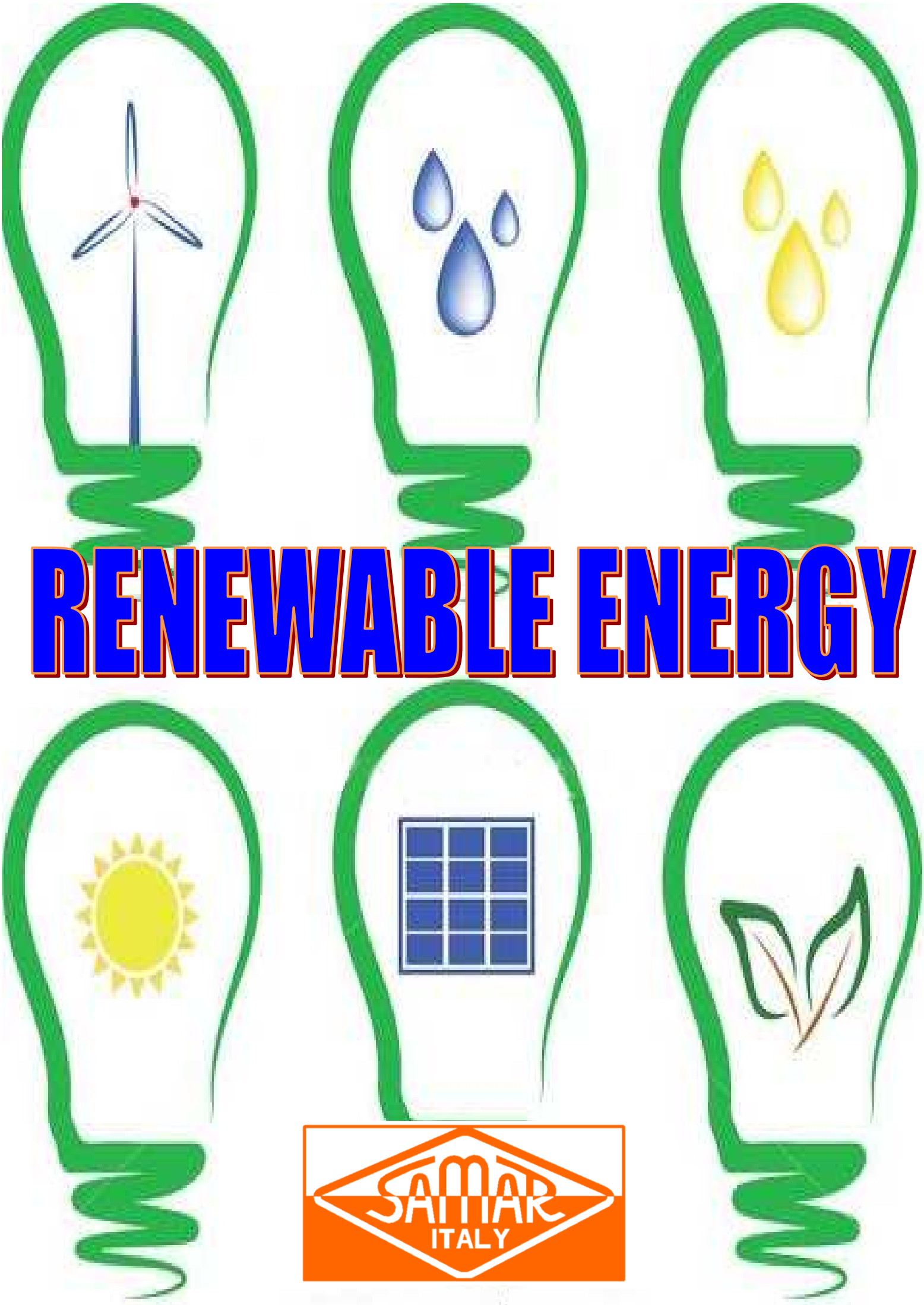
RENEWABLE ENERGY
SAMAR
ITALY

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Design & Project & Production & Trading of Industrial and Educational Instruments and Equipments

RENEWABLE ENERGY

Series of didactic systems that uses natural, renewable sources to produce energy. Different solutions are proposed to teach the most common applications in various situations. Parts are supplied in kits and each system is described in user instruction/reference manuals. The systems are modular and can be integrated to make more complex arrangements.

- **Photovoltaic: The sun light is converted into electricity**
- **Solar Thermal: The energy of the sun rays is used to heat a fluid**
- **Wind Power: The wind power is converted into the rotation of an electric generator**
- **Hydroelectric System**
- **Hydrogen Cell System**

Series of modules and instruction manuals with suggested experiences. The modules are equipped with points of measure through safety terminals to help the students during measurements and guarantee high level safety.

PHOTOVOLTAIC

PHOTOVOLTAIC MOUNTING BOX KIT 10 WATTS SOLAR CELLS TYPE SM10W

The student can learn the basics of a simple photovoltaic system.
It is possible to mount and dismount the trainer. A basic kit to produce electric energy for two lamps.
Included: N.110W solar cells panel; N.2 fluorescent lamps; N.1battery with Ah sized for the system; N.1 charge regulator; Manual and suggested experiences.
Cables and connectors are not included.
The kit is available on request for powers up to 100W. Also available are the components mounted on modules for connection with standard 4mm cables.

TRAINER SOLAR ENERGY TYPE KFV

Set of instruments and components to study the main characteristics of solar radiation and of photovoltaic conversion process. Manual and suggested experiences. Complete program of experiences which enable students to learn the main characteristics of solar radiation and of photovoltaic conversion process. 1 pyranometer with bar for shadow projection. It includes : digital milliammeter and voltmeter, load rheostat, 3 different solar cells, portable compass, manual solar tracking system, accumulator, d.c. motor, solar ruler, user manual.

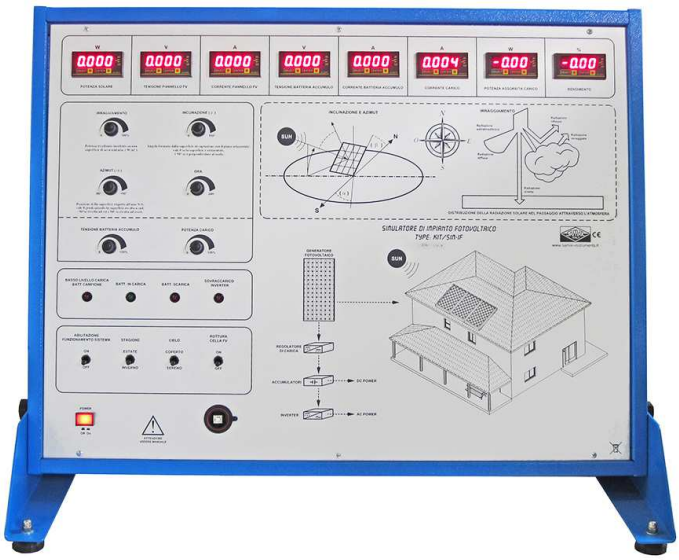
Included experiences : study of radiation intensity with different inclinations of the solar meter, Calibrating the solar meter with the solar radiation, Plotting charts of daily diurnal insolation, for total, diffuse and direct radiation, on horizontal surface and on surface perpendicular to the sun rays and graphical and statistical results interpretations; assessing the current output of a solar cell by changing its orientation to the light source; experimental assessment of voltage-current curves of a silicon cell for different lighting values; assessing the maximum electric power output by a silicon cell for different lighting or insolation values; calculating the efficiency of a photovoltaic cell; Parallel and series connection of solar cells; calculation of the average power supplied by a silicon cell panel; battery recharge

Included: N.1 professional solar meter; N.1 digital milliammeter with 3 ranges: 1 mA- 10mA – 100mA f.s.; N.1 digital voltammeter with 3 ranges: 1 V – 5V –10V f.s.; 0,1 - 0,5 – 1 A f.s.; N.1 load rheostat; N.4 silicon solar cells of standard and different dimensions; N.1 portable compass; N.1 solar tracking system and N.1 silicon solar panel; N.1 lead accumulator; N.1 d.c. motor; N.1 solar ruler; N.1 adjustable stand

SIMULATION OF PHOTOVOLTAIC SYSTEM TYPE KIT/SIM-IF

The student can simulate the inputs parameters (solar radiation, battery charge, ac power, solar panel angles, date and hour) using analog potentiometers. The simulator calculates the output parameters like solar panel voltage and current, battery voltage and current, inverter input and output current and power. The output parameters are visible on four digits precision instruments. Fully configurable simulation software.

The simulator requires PC connection via USB cableThis kit hardware + software to simulate accurately a photovoltaic plant of the "island" that includes virtually solar panels, control station, battery, inverter. The system is fully simulated using software algorithms. The simulator should necessarily be connected with a PC (supplied upon request).



KIT / SIM-IF uses acquisition modules and digital instruments with USB / SERIAL. It simulates a plant with an installed capacity of 1500 W, corresponding to an area of about 15 m^2 of panels with an efficiency of about 0.11. The open circuit voltage of the photovoltaic panels is 29.3 and the voltage at the point of maximum power is of 23.50 V. The inverter has a rated power of 1 kW and a rated power output of 0.95. The efficiency of the inverter decreases automatically for powers of less than 200 W or higher than 1kW. The simulator allows the introduction of data by means of potentiometers and display of system parameters using tools. It is required a connection to a personal computer, the simulation is run on the PC completely with the use of sophisticated algorithms.

Included experiences: location Latitude and longitude; calculation of the position of the sun setting and the position of the panel; irradiance: it can adjust the radiation from zero to about 1200 W/m^2; position panel: allows to set the orientation of the panel separately adjusting tilt and azimuth; calculation of the angle of incidence of sunlight on the panel (the angle between the direction perpendicular to the panel and the sun) ; calculation of solar power Ps from Ir irradiation, the surface of the Span panels, the performance of panels; calculation of the power and current required by the load; battery voltage buildup; calculation panel voltage and current panel; operation of the digital inputs. The simulator is equipped with 4 inputs: It enables operation system; switch Summer / Winter; Selector overcast / clear sky; break photovoltaic cell. Operation of the digital outputs. Calculation of performance

Included: panel with clear synoptic that reproduces the photovoltaic system; Board for data acquisition and control of output signals to the actuators; PC connection via USB cable; N. 6 potentiometers to simulate the inputs: solar radiation, storage battery charge, power requested by users, panel inclination angle (referred to the horizontal surface), panel azimuth angle (referred to south direction), time of day,

N.8 bar LEDs to simulate the outputs: photovoltaic panel voltage, panel output current, battery voltage, current supplied/absorbed by the battery, current absorbed by the inverter, solar power incident on the photovoltaic panel, power absorbed by users, system efficiency

N. 4 switches to simulate the inputs: enabling system operation; season (summer/winter); clouded sky; breaking of a photovoltaic cell

N. 3 LEDs to simulate the outputs: alarm for low charge level of the storage battery; alarm for inverter overload; battery in charging or discharging phase; Simulation program of photovoltaic system operation

N. 8 digital displays

SIMULATOR TO STUDY OF THE CONVERSION OF RENEWABLE ENERGY TYPE EA/CONV

This converter simulates the principle of an industrial design. The electric power supplied by a system of alternative energy is rectified by a Graetz bridge. This DC voltage is converted by a DC / AC 230V AC 50Hz. If the range is exceeded, the output of the converter disconnects instantly and illuminates a light indicator of an overload. A reset button restores the normal operation

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PHOTOVOLTAIC SYSTEM TEACHING FOR THE STUDY OF SOLAR – stand-alone version
TYPE SIMFVIS
TYPE SIMFVIS/C (version on trolley)

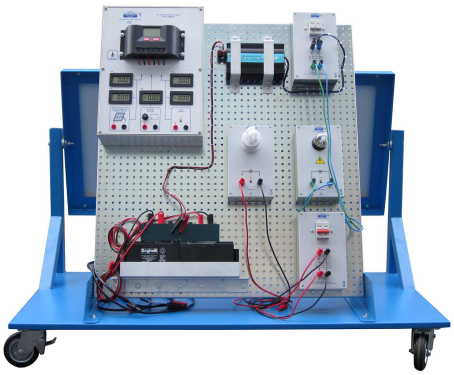
Type SIMFVIS

The kit includes:
• N.2 solar panels 12V 25W mounted on tilt stand to adjust the lighting angle and study the condition of maximum efficiency of panel
• N.1 box with clear synoptic including: unit load regulator for solar panels; N.3 digital ammeter connected to the battery and load
N.1 digital voltmeter connected to the load; N.1 digital voltmeter connected on solar panels
• N.2 Batteries suitable plant for series and parallel connections
• Adequate number of connecting cables

The control unit incorporates a microprocessor which an algorithm "fuzzy" and of a self-learning process is able to optimize the operation of the system ensuring the proper feeding of the load and the correct sequence of charge / discharge of the batteries. The controller automatically recognizes the nominal battery voltage (12 or 24V).
During the hours of exposure to the sun panels the electricity they produce is delivered to the load, maintained at nominal voltage. The excess energy goes to charge the battery. When the battery is fully charged the control unit interrupts the charging process avoiding the development of gas and damage to the battery itself.
When solar energy is no longer sufficient to supply the load, control unit draws energy from the battery. The load is maintained at nominal voltage. The control unit is able to recognize the situation of weak battery. In the latter situation the battery is protected from deep discharge through detachment from the load.
Regardless of the variation of the incident rays on the panels the control unit uses the battery in buffer to maintain constant voltage on the load.

ALL OPERATION ARE WELL VISIBLE AND FULLY DOCUMENTED BY TEACHING PANEL CONTROL
16-character display to display the main parameters in a cyclic manner. Battery voltage, charge status, battery charge current, current to the load;
POSSIBILITY OF SERIES OR PARALLEL CONNECTION PANEL AS A FUNCTION OF VOLTAGE LOAD RATED
Opportunity to study: calculation of the average power developed by the sun in a particular location, characteristics of the photovoltaic cells, energy balance, performance of the system by means of special equipment with optional measuring solar radiation; series and parallel connections of photovoltaic panels, conversion and distribution storage energy, analysis of the use of energy system and measures the voltage and current and battery charging; lighting techniques, programming of the controller.

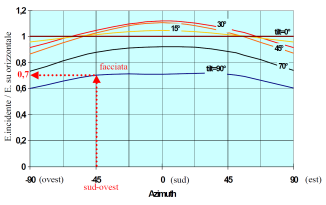
Type SIMFVIS/C side solar panel



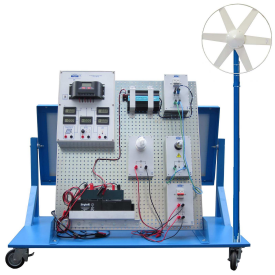
Type SIMFVIS/C side instruments

OPTIONS

- lamps for indoor use photovoltaic panels
- pyranometer, solar power meter or instrument certification for photovoltaic systems
- acquisition tool for electrical parameters with numeric and graphic display interface and the APR / FR-ARM
- inverter to obtain alternating current
- software



OPTION FOR TYPE SIMFVIS / C WIND TURBINES 60W TYPE SIMEOL60
Complete set up the trolley SIMFVIS / C
Use the same unit and components



Ver 04.15

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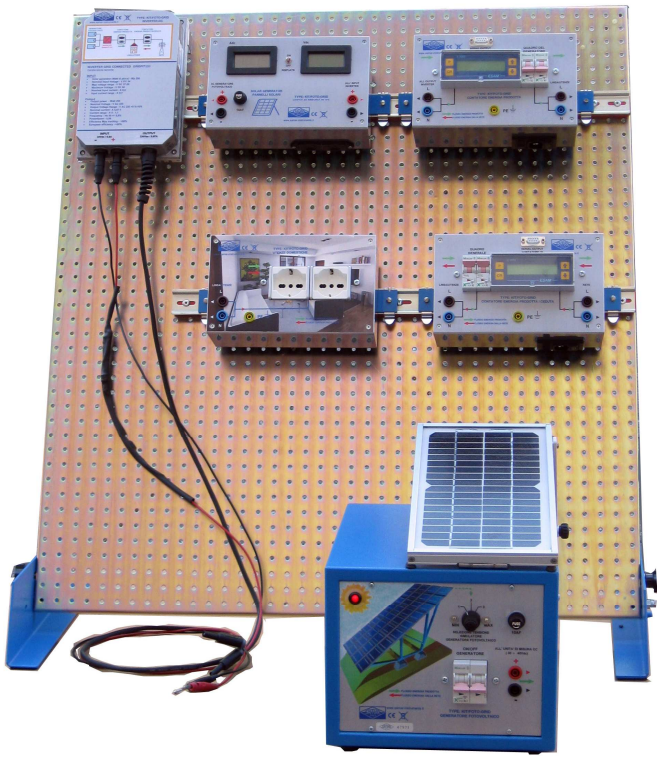
GRID CONNECTED SOLAR SIMULATOR KIT TYPE SIMFVGC FOR THE STUDY OF SOLAR TECNOLOGY SYSTEM CONNECTED TO THE SIMULATED PUBLIC NETWORK

This kit simulates a system connected to the public network, with provisions for compensation of the energy supplied to the grid. Instruments with USB interface.
Trainer with solar panels to analyze the process of conversion of the solar energy in electric energy.
The trainer includes: dc power supply signed Photovoltaic generator, inverter solar 'grid connected' power 200 W; N. 2 multifunction instruments for measuring voltage, current, electric power and energy at mains voltage; interface to the computer; modules for connection utilities; modules for dc voltage and dc current measurements; adjustable stand for modules; cables; software.
Separate power supply allows to study DC/AC conversion and grid connection without use solar panels.
On request computer interface
Metal panel with pedestal on which are fixed the various components connected by standard laboratory cables.

The kit includes:

N.1 AC variable voltage steps signed photovoltaic generator
N.1 solar inverter 'grid connected' power of 200 W
N. 2 Multi-function meter for measuring voltage, current, power and energy.
N.1 RS485A USB converter for interfacing instruments to computer
N.1 module with two sockets for the connection of mains voltage loads
N.1 module to measure voltage and current
Tilt stand for mounting the modules
cables
Software

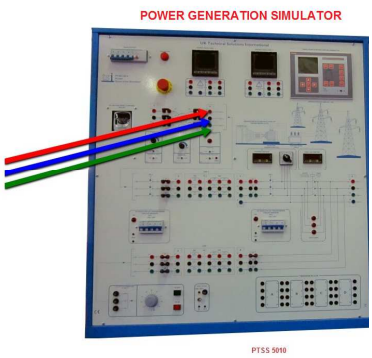


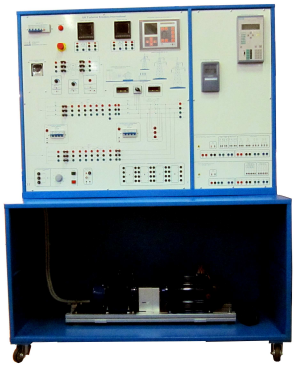
Solar panels deliver DC voltage. When connecting several panels in series / parallel it is possible to reach voltages of tens of volts with high currents. In order to enter in the network and then sell the energy you need to convert AC voltage through an inverter. The inverter must also be able to engage in frequency and phase to the network (that is supposed to infinite power) delivering the power produced. In this type of system all the energy generated is fed instantly into the network, there is no accumulation with batteries. Normally, the PV system is connected to the network via a dedicated circuit, with counter and protective device independent from the home user. In case of absence of mains voltage the inverter stops and does not supply alternating voltage. This is required for safety reasons by the grid operator. Plants of this type can not be used as a reserve in the event of lack of electrical energy. In this kit the DC voltage, that normally in a real photovoltaic comes from the panels, it is generated by a power supply.

Available system to study:

Parallel of photovoltaic system with a network

Parallel of wind system with a network





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PHOTOVOLTAIC INSTALLATION

SOLAR PANEL AND TROLLEY

Manual version for inclination control

SOLAR PANEL AND SOLAR TRACKER DOUBLE AXES AND CONTROL SOFTWARE

With trolley
The Cell Panel position is adjusted to the Sun position by a sun tracking apparatus controlled by a Personal Computer.
You can combine it with wind power kit for use simultaneous or alternating

TYPE KCFVIS200

azimuthal
suitable for solar panels up to 200W
solar tracking system based on the historical path of the sun
when shown the latitude and longitude of the computer directs the solar panel according to the historical path of the sun from sunrise to sunset

TYPE KCFVIS100

suitable for solar panels up to 100W
solar tracking system based on sensor that follows the light

OPTION: WIND TURBINES

to match the photovoltaic kit for single or combined use

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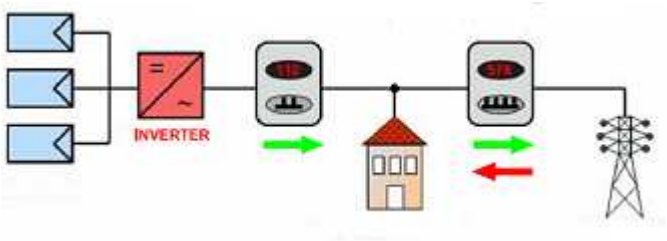
GRID CONNECTED SOLAR SIMULATOR TYPE KCGC

TO COMBINE THE KIT FOR SOLAR PANEL / SOLAR TRACKER WITH TROLLEY SHOWN ABOVE

(You can combine it with wind simulator kit for use simultaneous or alternating)
It allows you to create your own solar power system from 250 watts. You have to connect the solar panel and insert the inverter directly into any electrical outlet housing.



INPUT
250 Wp solar inverter
Rated voltage 34 VDC 1x34 V 2 x 34 V MPP or
MPP parallel or 2 x 17 V MPP serial
Current 0-7 Adc.
Rated power 6.6 Adc.
Mppt voltage range 27 to 50 VDC

OUTPUT
Max capacity 200 Watt output
Rated voltage 230 VAC (-10% +5%)
current range 0 to 1.1 Amp
Nominal power 0.87 Amp
Frequency of 50 Hz (+ / - 1%)
cos.phi 1
MPP efficiency> 98%

MEASURE KIT INCLUDING:
n. 2 modules bi-directional energy meters
n. 1 module measures voltage and current of the solar panel
n. 1 module 220V connection gried connected
software control energy bill

STAND ALONE PHOTOVOLTAIC SOLAR SIMULATOR TYPE KCISOL

TO COMBINE THE KIT FOR SOLAR PANEL / SOLAR TRACKER WITH TROLLEY SHOWN ABOVE

(can combine it with wind simulator kit for use simultaneous or alternating)

Included: CHARGE CONTROLLER, SOLAR STORAGE BATTERIES, INVERTER

Pure sine wave, allow you to power with batteries DC (12V, 24V and 48V) any electronic equipment in AC 230V up to the rated power of the inverter. Digital microprocessor control guarantees high performance. Voltage: 24V Voltage range: 21-32V (max) Nominal power /30 min / peak: 300/350/650 W Efficiency: 94% Output voltage stabilized (230V + / - 5%, 50Hz + / - 0.05 %) Protection against short circuit and reverse polarity protection - Protection against overload, overheating and overcurrents. Disconnect automatic alarm in case of low battery

THEORETICAL-EXPERIMENTAL MANUAL

KIT SOLAR SYSTEMS WITH INTERFACE TYPE KFVI

TO COMBINE THE KIT FOR SOLAR PANEL / SOLAR TRACKER WITH TROLLEY SHOWN ABOVE

This system includes: charge controller, inverter, a solar storage batteries and some lamps designed to simulate the operation of a typical stand-alone photovoltaic equipment to transform solar energy into electric power through solar panel. The supervision system supplied, connected with a PC (offered upon request), allows to monitor the main electrical operational parameters, both in direct current (before the inverter) and in alternate current (after the inverter).

Included experiences : Study of solar energy: calculation of the average power developed by the sun on a specific place; Silicon cells; Energy balance; Efficiency; Batteries charge control; Photovoltaic modules series and parallel connection; storage energy; Energy conversion and distribution; Typical applications.

SOFTWARE:
The data acquisition and supervision system and the use of a Personal Computer enable to: display the instantaneous power available at the generator outlet, at the storage battery outlet/inlet, at the inverter inlet, as well as the incident solar radiation on photovoltaic modules and the power thus generated, the conversion efficiency of solar energy; display on table the curves of the power generated by the system, of the power stored or supplied by the battery, and of the power feeding the inverter, versus time; plot by points the characteristic current–voltage curve and output power-voltage curve of photovoltaic generator, to store the collected data for future analyses and to compare various curves corresponding to different conditions; Moreover, the development software enables to modify the application programs supplied with the equipment and to create new customized applications, thus leading to learn and develop programming techniques. Furthermore, the remote measuring system of alternating current parameters enables to: display all the measures of these parameters, including peak and average values, in real time; display the trend of the values measured by the instrument, on a table; create a file of historical data; display the historical data on tables, or as graphic representation of the trend; create digital and graphic reports of energy consumptions on a flexible (daily, monthly, yearly) base; transfer the data of these reports to Excel for future analyses and examinations

INCLUDED: DC voltmeter and DC ammeter with USB interface; Charge controller; Solar batteries; Inverter 300W; Photovoltaic panel with 2 modules, each one with 100 W peak power;
Power supply: 230 Vac 50 Hz single-phase - 50 VA (Other voltage and frequency under request)

OPTION

- ✓ lamp for load with insertion by switches
- ✓ pyranometer or complete instruments for certification photovolaic installations
- ✓ digital instruments A-V- W-VAR- Wh- VARh- cosØ for single and threep-hase measurements type APR-FR/ARM2 with interface – software – harmonics
- ✓ inverter
- ✓ software

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WIND POWER GENERATOR KIT

to match the photovoltaic kit for single or combined use

TYPE SIMEOL400

This equipment represents the typical confi guration of a wind power generator, used to convert directly the wind kinetic energy into mechanical energy.
Included experiences : Study of wind energy: calculation of the average power developed by the wind on a specific place; The wind power generator: typical structure; installation; orientation; "Brushless" generator; Study of the voltage regulator according to the variation of the wind speed and energy conversion; storing energy; Typical applications; charging batteries.
Included: wind power generator 400W with trolley (on request 200W TYPE SIMEOL200)
Rated power: 400 W Startup Wind Speed 3,6 m/s Rotor Diameter 1.17 m Voltage 24V (on request 12-48V) Turbine Controller Microprocessor-based smart internal regulator Body Cast aluminum Blades Injection-molded composite Alternator Permanent magnet brushless Electronic torque control
Control panel containing: load regulator, digital ammeter, digital voltmeter, battery
THEORETICAL-EXPERIMENTAL MANUAL
OPTION; lamp for load with insertion by switches; digital instruments A-V- W-VAR- Wh- VARh- cosØ for single and three-phase measurements type APR-FR/ARM2 with interface – software – harmonics ; inverter; software, anemometer ; clamps

On request computer interface

SYSTEM FOR INDOOR OPERATION OF WIND POWER GENERATOR
TYPE KEOLSIM

Motor with speed regulator and adapter to be installed in place of the turbine blades for generator operation in windless environment. This system, coupled to an asynchronous motor, enables to power the wind turbine (which is not part of this system; the blades must be removed before use) indoors.
Determining the power output by the turbine with the instruments. The system is supplied with an inverter for r.p.m. control of the motor.

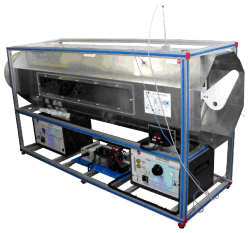
OTHER VERSIONS

same characteristics shown above but

TYPE SIMEOL90 **wind power generator 90W with trolley**

TYPE SIMEOL60 **wind power generator 60W with trolley**

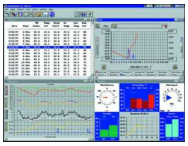
You can use 60W typical fan to simulate the wind



ON REQUEST
wind tunnel for wind generator

OPTION:

Meteo kit



digital instruments A-V- W-VAR- Wh- VARh- cosØ for single and three-phase measurements
type APR-FR/ARM2 with interface – software – harmonics

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Energy saving kit type KRE

Kit analysis and study of energy saving. Trainer kit to investigate and study the concepts of applications based on energy saving in industrial and residential systems.
Includes:
N. 1 Module with n.3 lamps E26
N. 1 Module simulation single-phase system
N. 1 Module halogen lamp 230V 75W
N. 1 Module incandescent lamp 230V 75W
N. 1 Module fluorescent lamp and low-consumption light output equivalent to a 75W incandescent bulb
Connection cables
The kit proposes the study of energy saving applied to a lighting system. In particular compare a lighting system with traditional incandescent lamps and lamps "energy saving" low consumption. Both systems offer the same luminous flux (neglecting the color tone) and can be regarded as equivalent. The comparison will highlight the various technical aspects and costs. The module is a lighting dummy with an installed capacity of about 7500W (incandescent).

OPTION: digital instruments A-V- W-VAR- Wh- VARh- cosØ for single and three-phase measurements type APR-FR/ARM2 with interface – software – harmonics

INSTRUMENTATION:

DIGITAL LUXMETER
DIGITAL THERMOMETER AND PROBE
MULTIFUNCTION INSTRUMENT ENVIRONMENTAL: light sound humidity temperature
DIGITAL MULTIMETER HANDHELD 3 ¾ digits
Instrument test electrical continuity, connections between modules, grounding and surge of the type CT/1B
Insulation tester

Digital wattmeter type SLD-E/WDM for use in DC and AC measurements for Pcc
Digital wattmeter type SLD-E/WDM for use in DC and AC measurements for Pca
pyranometer – solar power meter
Anemometer
clamps

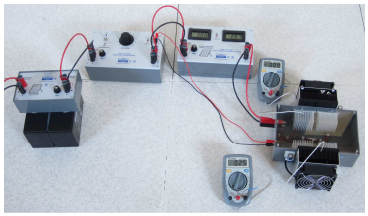
SOLARIMETER - SOLAR POWER METER type SM / SPM 13

Measurement of sunlight up to 1999W / m2 or 634BTu / (ft2 • h) resolution 1W / m2; 1BTu / ft2 • h
High accuracy and speed in response- Data hold function (DATA HOLD)
Large display easy to read LCD 3 1/2 1999 counts - Range of choices units of W / m2 and BTU / (ft2 • h)
Manual range selection - Direct reading without adjustments
Value Max. And Min. Low battery indicator

Multifunction instrument for testing photovoltaic systems and electrical power analysis

complete with software, calibration certificate, bag, cables, solar meter, 4 clamps and grounding kits.
Measures: AC and DC power, radiation and temperature are performed at the same time, simply press a button and wait for the result! All measured values are automatically entered in the formulas and will be calculated automatically side the success or failure of the test. In case of failure the instrument will indicate the cause of the failed test.

Peltier cell trainer



This cell allows you to convert thermal energy into electrical energy, and vice versa.
Box with 2 peltier cells and fan. Power supply , manual controller, n° 2 digital thermometers.
User manual

SAMAR s.r.l. Web: www.samar-instruments.it
Via della Pace n. 25 Fr. Zivido - 20098 San Giuliano Milanese - Milano – Italy
Tel.: (++39) 02 98242255 (r.a.) Fax:(++39) 02 98242279 E-mail: info@samar-instruments.it
Catalogo on line: www.samarinternet.com

Design & Project & Production & Trading of Industrial and Educational Instruments and Equipments

NO PRESSURE THERMAL SOLAR SYSTEM WITH HEAT STORAGE FOR RESIDENTIAL HOUSE SPACE HEATING

Solar heater is made of parallel rows of transparent glass tubes. Each tube contains a glass outer tube and metal absorber tube attached to a fin. The fin is covered with a coating that absorbs well solar energy, but which inhibits radiative heat loss. Air is removed from the space between the glass tubes and the metal tubes to form a vacuum, which eliminates conductive and convective heat loss. A well-insulated storage tank stores hot water. The system uses a pump to circulate household water through the collectors and into the home.
The kit includes:
n. 1 solar thermal panel made with glass tubes at a high vacuum tank with a capacity of 100 liters
n. 1 floating barrel having the task of ensuring the complete filling of the tanks without additional pressure to atmospheric.
n. 1 vent pipe U-folded with the task to let out the water when the volume increases as a result of heating.
Outlet tap hot water
Off valve to open / close the circuit of the radiator
Circulator pump to the heating circuit
Electronic control unit for controlling the pump
Thermostat.

SOLAR WATER PUMPING STATION
Type SM / POMPSOL

Solar pumping station completely autonomous. The system allows students to understand and analyze its operation. Photovoltaic solar panel mounted on a chassis with variable inclination. Output terminals. Connecting cable. Tank that simulates the source of water under the ground. Transparent tank for water storage pumped. Tap that simulates the consumption of the user with the return water to the tank. Pump of adequate size. Batteries to power the pumping station when the sun is no longer present. Controller battery charge.

Miniature hydroelectric power generation with Pelton turbine, pump and instruments. Computer wi-fi interface available.

The trolley kit includes:
Stainless steel tank capacity 140 liters
Pelton turbine with generator
electric pump
Variable speed drive for electric
Flow Transmitter
Pressure transducer
n. 1 RF converter / USB to connect to the USB port of the PC
n. 1 sinotticato panel comprising:
switch differential thermal
Emergency button
Section adjusting power pump with switch START/STOP switch, ENABLE/RESET
n. 5 digital instruments, with indications of turbine rotation speed, pressure, flow, output voltage, output current. The instruments are equipped with internal module for wireless data transmission Complete with software for experiences.
OPTION: trolley for instruments and other accessories

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ENERGY MANAGER

see special dedicated documentation

The technological evolution requires continuous training of technicians to support change.
A good training is a combination of theory and practice.
The simulator to perform exercises plays an important role for good training.

SAMAR PROPOSES: innovative systems composed by different autonomous simulators studied to work in serial connection or alone. With this system it is possible also to study the level of the quality of the electrical networks, harmonics and with implementation electrical and magnetic field at 50 Hz or 60Hz.
Instrumentation and protection devices used in the panels are industrial and professional level to the top.

objectives:

- Simulate faithfully the Laboratory in the production of electricity (Power Plant)
- Study the techniques Generation, Distribution and Control of Energy
- Forming technicians for maintenance and management
- Learn the diagnostic systems and techniques of network maintenance
- Learn the protective devices for the safety of people and things
- Recreate in the Laboratory the protection systems of networks of high and low voltage
- Learn the techniques of control of the power factor correction
- Forming technicians for maintenance and management of distribution stations
- Learn the design criteria of the cabins
- Simulators production stations and parallel generators
- Control of the generation and transmission with professional equipment
- Simulators of transmission lines
- Know the electrical machinery, instrumentation and protection devices

- PRODUCTION
- TRANSMISSION
- DISTRIBUTION
- PROTECTION
- SOFTWARE

equipments:

The proposal consists of two different solutions for modular and complete laboratory:

BASIC SOLUTION

- compact equipment
- modular and economic solution

PRO SOLUTION

- modules on trolley
- complete and modular modules for a detailed study of the topic energy
- possibility of control with SCADA

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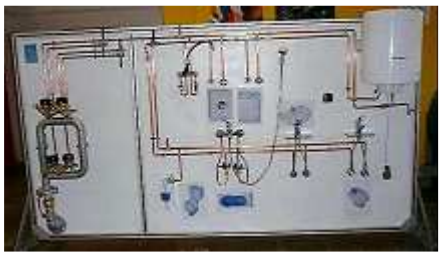
THERMOTRONICS

see special dedicated documentation

HEATING

AIR CONDITION AND VENTILATION

SANITARY



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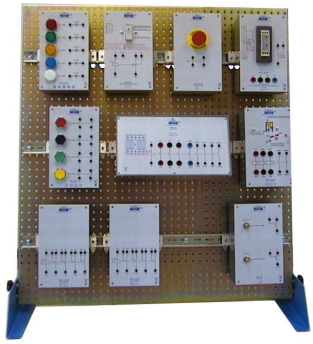
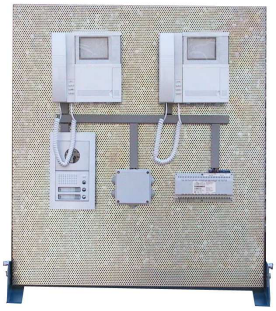
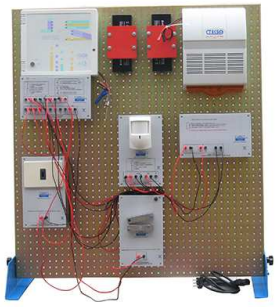
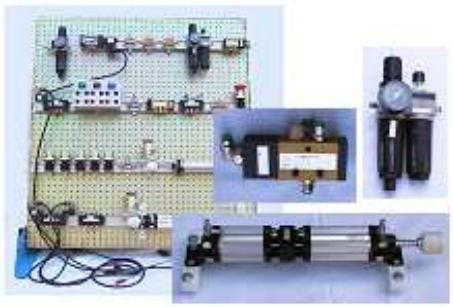
ELECTRICAL INSTALLATIONS

see special dedicated documentation









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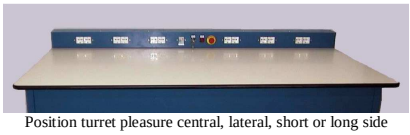
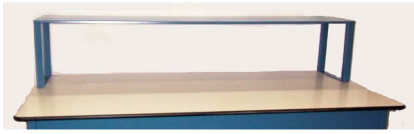
WORKSTATIONS

On request customized versions - see special dedicated documentation



Position turret pleasure central, lateral, short or long side



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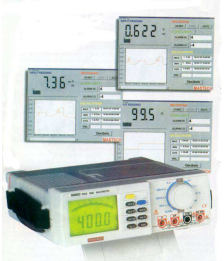
DC AND AC POWER SUPPLIES

On request customized versions - see special dedicated documentation

anti-vandalism cover

INSTRUMENTS



SAMAR: LEVEL OF TECHNICAL EDUCATION

University
Higher Education
Vocational Training

SAMAR: TECHNOLOGY AREAS

- **Workstations**
- **Electrical and electronic instruments**
- **Electricity :**
  electrical measurements
  electrical machines
- **Energy manager:**
  energy and quality of the energy
  renewable energy
- **Electrical installations**
- **Pneumatics and electro-pneumatics**
- **Electronics**
- **Control & Automation**
- **Thermodynamics**

service – repair – maintenance - certification

SAMAR A CERTIFIED COMPANY ISO 9001: 2008

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Agent / Distributor:

Pre and post sales:

- **making rules, maintenance, repair, calibration and certification of your equipment also not our production**
- **Training and training courses, counseling, seminars**